

EFFECTS OF CAPITAL ADEQUACY ON THE COST OF INTERMEDIATION AND PROFITABILITY OF SELECTED BANKS IN THE PHILIPPINE BANKING INDUSTRY

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ABSTRACT

The Bangko Sentral ng Pilipinas (BSP) has adopted the Basel I Framework: the Basel Capital Accord of the Basel Committee on Banking Supervision (BCBS) in 2001 to timely cope with the growing industry of the Philippine Banking System. This study seeks to justify the various claims of previous researches in the effects of capital requirements on the cost of intermediation and profitability of banks. Factors have contributed in the increase of cost of intermediation and positive profits in the post-capital regulation: capital requirements, increase in management efficiency, enhancement of banks' liquidity, bank size, and cost efficiency. To sum it all, results have shown that the BSP's efforts to maintain financial stability by enforcing capital regulations have been advantageous to the banking sector of the Philippines.

KEYWORDS: Capital Requirement, Cost of Intermediation, Profitability, Capital Regulation, Panel Data Estimation

INTRODUCTION

Attaining greater financial stability encompasses sequential changes in the global financial system. The financial market has undergone transformation in its previous years. Financial institutions were forced to accept greater risks and launch innovation due to severe competition. Shareholders of banks would be disappointed if it is not in line with profitable and high-leveraged security business (Denters, 2009).

The banking sector serves an important financial intermediary role in the Philippine economy. This makes its condition very significant to the economy at large. Knowing the fundamental factors influencing the profitability of the financial sector is vital not only for the bank managers but also for the stakeholders (central bank, government, and other financial authorities), given its relationship with economic growth and banking sector's well-being. Through the awareness of these factors, managers and regulators would be aided in formulating future policies intended to improve the Philippine banking sector's profitability (Rajan and Zingales, 1998; Levine and Zervos, 1998). Collective efforts of both the banking sector and the regulations of the central bank to timely cope with the growing industry have been advantageous to the Philippine banking system. Strong profitability has continued to be seen as the bank's net profit as of December 2013 raised at PhP144.9 billion, which 18.5% higher compared to the previous year. The other sources of funding which includes capital at 12.7 percent grew by 7.0 percent to PhP1, 125.6 billion year-on-year. Return on assets (ROA) remained stable at 1.6 percent while return on equity (ROE) improved to 13.3 percent from 12.4 percent last year. Yet, cost-to-income ratio, which is a common measure of bank efficiency, reduced to 60.6 percent at the end of December 2013 from 63.2 percent on its previous year (BSP, 2013).

Establishing a stable monetary and financial system is the core purpose of implementing regulations. Unpredicted heavy losses long time ago led to the formation of the Basel Committee on Banking Supervision (BCBS). This committee seeks to set minimum supervisory standards and guidelines and recommends it to their member-countries for an effective and quality banking supervision. Basel I: the Basel Capital Accord was the first framework introduced to resolve the heightened Latin America debt crisis which perceives that banks capital ratios are deteriorating at a time of growing international risks. The capital framework is said to be evolving over time in order to meet increasing risks from banks' exposures to international market. In replacement of the first Accord, Basel II: the New Capital Framework was issued (Godhart, 2011). This has been adopted by the Bangko Sentral Ng Pilipinas (BSP) by 2006 as a development from its previous capital regulation implemented on 2001 where, aside from the incorporation of credit and market risk, operational risk and other risks have been accounted to make capital requirements more risk sensitive and the addition of supervisory review and market discipline. But recent financial crisis in 2008 brought the release of Basel III rules, where standards of previous framework have been amended, and which, at the present, is the capital adequacy framework of the Philippines (BSP, 2010).

Background of the Study

The BSP is the government institution which implements policy guidelines in the areas of money, banking, and credit. It is divided into three sectors namely the monetary stability sector that is in charge of the formulation and implementation of monetary policy; the supervision and examination sector which enforces and monitors compliance to banking laws to promote a healthy banking system; and the resource management sector which serves the resource needs of the institution. The supervision and examination sector has the supervision over the operations of banks, provides the key prudential regulations, and perform other functions. The Philippine banking system is currently composed of 5,055 universal and 459 commercial banks, 1,856 thrift banks, and 2,495 rural and 155 cooperative banks. Universal and commercial banks represent the largest group of financial institutions in the country and offer the widest variety of banking services. Studies have shown that capital regulations played a big role on the global crisis countries have undergone. Dietrich and James (2008) defined bank capital primarily as a source of funding and will serve as a backup that is capable to absorb in case of losses. This has also been pointed out by the results of Mbizi (2012) that the major reasons behind the capital regulations imposed was to maintain bank safety and soundness, protect bank creditors and depositors in the event of a bank failure, create a disincentive to excessive risk taking by banks, and provide a buffer against losses for banks. On the other hand, Sheldon (2001) suggests that when the benefits of raising capital standard exceeded their optimal level, it would decrease economic welfare, thus increasing the cost of intermediation and lowering the profitability status of the banking industry. In 1999, Blum has also found out that capital adequacy requirements actually have the potential to increase risks. At the same time, the more constraints levied on banks, the lesser their ability to expand credit and could hinder the economy in achieving growth.

According to Murinde and Yassen (2006), using data from the Middle East and North African region where it measures the impact of Basel Accord regulations, they found that capital requirements affect significantly banks' capital ratio decisions and that regulatory pressure did not prompt banks to increase their capital, but positively affect their chosen risk levels. Jablecki (2009) also argued that the Accord was successful in maintaining higher capital ratios yet encouraged a decrease in bank lending, amplifying the bank lending channel. As a whole, capital reserves act as a buffer against losses and failure. Developing countries are in need of major reforms that will offset inadequate capital and weak banking supervision. Capital adequacy regulations have a crucial role in aligning the incentives of bank owners with those of depositors and other creditors. This study will tend to justify the various claims of previous researches and that capital requirements may opt to

increase the cost of intermediation and reduce bank performance on the adjustment stage prior to the issuance of the Basel Accord, but will somehow prove that enforced regulations will enhance the selected banks of the banking industry in the Philippines in long-term period. Research will focus on the effects of capital adequacy set by the BSP on the cost of intermediation and profitability of selected banks. An in-depth data utilization, which will cover the pre regulation and post regulation periods and the best use of model estimators, to clearly measure and assess the behavior of the variables.

On whether capital requirements restrain or promote bank profitability and stability, inconsistent results of theories were obtained. A safe, sound, and healthy financial system is important not only to avoid adverse effects of economic downturns and financial crises but also to avoid negative budgetary consequences for the government. Key prudential regulations are inevitable to protect the banking system and one form of this regulation is through capital requirements. The arguments of the previous researches has led to a question on what should be the proper implications of banking regulations without making banks vulnerable to shocks and limiting their ability to create more profits and stimulate economic growth.

EMPIRICAL ANALYSIS

Data

The main source of data is taken from the banks' financial statements disclosed on Bloomberg Finance (L.P.). All data are on quarterly basis from year 2004 up to the last quarter of 2013. The most recent top eight listed banks in the Philippines based on capital were chosen to observe in this study. Figure 1 presents the proxy variables used in this study to measure the cost of intermediation and profitability of banks relative to capital adequacy. Capital adequacy is computed using the equity to total assets ratio. Two alternative measures were used to represent the cost of intermediation: ratio of net interest income over average earning assets (NIM1) and the ratio of net interest revenue over average total assets (NIM2). Return on assets (ROA), computed using the ratio of net income to total assets; and return on equity (ROE), computed using the ratio of net income to total equity, both represent the profitability of banks. ROA reflects the ability of banks to generate profit from bank's assets and ROE indicates the return to shareholders on their equity. In addition to the variables mentioned, list of bank characteristics derived from Angbazo (1997), Allen (1988), and Ho and Saunders (1981) theoretical models are included in the equation to signify other internal determinants of the dependent variables. The management efficiency variable is the ratio of earning assets to total assets. The higher the ratio, the higher management efficiency is. As managers strive for more earnings, it is likely that they would increase the cost of intermediation, which would enhance profits. However, Casu and Girardone (2004) point out that " ...the most cost efficient banking groups seem to be also the least profitable" (p. 693). The cost efficiency variable is the cost of overhead to total assets. The higher the cost the less profitable banks are. To counter this effect, banks would charge a higher cost of intermediation. Liquidity variable is measured by the ratio of total loans over total deposits. Higher figures denote lower liquidity. This variable measures the risk of not having sufficient reserve of cash to cope with withdrawal of deposits. Predictions vary regarding the effects of liquidity on the cost of intermediation and profitability. One view suggests that excess liquidity may force banks to lower the cost of intermediation as they try to reduce non-earning assets. Alternatively, in a tight financial market where demand for credit is limited, banks may be forced to raise the cost of intermediation in an attempt to increase profits. Bank size variable is the represented by total assets of a bank. This may serve as a proxy for the degree of monopoly. The bigger the size of the bank the higher the degree of monopoly power, enabling banks to charge a higher cost of intermediation. Profits are likely to increase as a result of economies of scale. However the empirical results concerning bank size are mixed, since some studies found economies of scale for large banks (Berger and Humphrey, 1997) and others diseconomies for larger banks (Vennet, 1998).

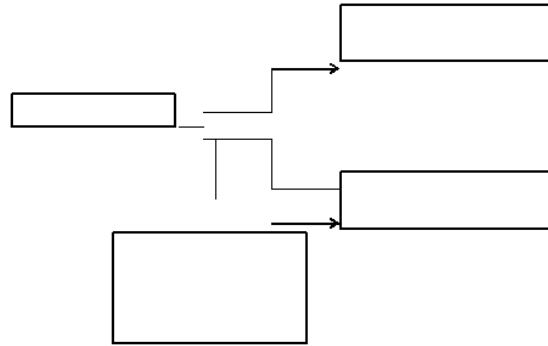


Figure 1: Conceptual Framework

Empirical Models and Econometric Modelling

Empirical analysis of universal and commercial banks assess how the performance of banks is being affected by such capital regulations. An empirical dynamic balanced panel data model which explains the cost of intermediation and profitability that includes the measure of capital adequacy and other factors which was based on the methodology of Naceur and Kandil (2008) has been used as a basis in this study. Where Y_{ijt} is the one period lagged cost of intermediation or profitability, c is a constant term, δ is the speed of adjustment to equilibrium, X_{it} s with superscripts b and m denote bank characteristics and macroeconomic indicators respectively and ε_{it} is the disturbance:

$$Y_{ijt} = c + \delta Y_{ijt} + \sum_{b=1}^S \beta_b X_{it}^b + \sum_{m=1}^M \beta_m X_{it}^m + \varepsilon_{it} \quad (\text{Eq.1})$$

Since macroeconomic variables have been excluded and prior adjustments were performed in this paper, a revised simplified equation to estimate the effect of capital adequacy to the cost of intermediation and profitability of selected banks was designed to meet the objectives where Y_{ijt} represents the cost of intermediation or profitability, i is the top 8 listed universal/commercial banks, t is the quarterly date from 2004 to 2014, c is the constant term, ε_{it} is the disturbance, $CAPR$ is the capital adequacy ratio, and X_{2-5} represents the bank characteristics

$$Y_{ijt} = c + \beta_1 CAPR_{it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + \beta_5 X_{5it} + \varepsilon_{it} \quad (\text{Eq. 2})$$

Combining cross-section and time-series data is useful for three main reasons. First, it is necessary when analyzing the performance of Philippine selected banks because it varies over time, and the time-series dimension of the variables of interest provides a wealth of information ignored in cross-sectional studies. Secondly, the use of panel data increases the sample size and the degree of freedom, which is particularly relevant when a relatively large number of regressors and small number of firms are used. Thirdly, panel data estimation can improve upon the issues that cross-section regressions fail to take into consideration, such as potential endogeneity of the regressors, and controlling for bank-specific effects. For panels with a limited number of years and a substantial number of observations, Arellano and Bond (1991) suggest estimating the equation with Generalized Method of GMM in first-differences. First differencing the initial equation removes the time invariant u_i and leaves the equation estimable by instrumental variables:

$$y_{it} - y_{it-1} = \alpha_i (y_{it-1} - y_{it-2}) + \beta (x_{it} - x_{it-1}) + (u_i - u_i) + (v_{it} - v_{it-1}) \quad (\text{Eq.3})$$

RESULTS

Table 1 shows the summary statistics for the sample and Table 3 presents the results of the estimation. The correlation of unobserved bank characteristics' internal effect and the correlation and endogeneity of the independent variables were the reasons why various estimations have been conducted. Pesaran test and Hausman test were performed for Pooled OLS, Between, FE (within), and RE (overall) estimates, but still inconsistent, biased, and unsatisfactory results were acquired. To address model estimation issues, first lagged dependent variables were used as instrumental variables (IVs) and significant improvement of the results were noted.

For the cost of intermediation, only NIM1's first difference fixed estimation was the most appropriate model and showed that CAPR has high positive coefficient with 0.039 ($p < .05$) significance value. This only proves that as capital adequacy standards continue to rise, the banks' cost of intermediation also rises significantly. NIM2 estimation failed to produce qualifying results and therefore was not accounted as a reliable model. Bank size has a positive relationship on net interest margin of 0.02 ($p < .05$) significance value, hence suggests that most of universal and commercial banks in the Philippines use their monopoly power in setting lending and deposit rates. None of the coefficients of management efficiency, cost efficiency, and liquidity significantly explains the cost of intermediation. Results are by means inconsistent with results of Naceur and Kandil (2009). Although both results of CAPR and cost efficiency were similar, the other variables left showed different outcomes across literatures.

To complete the analysis regarding the effects of capital adequacy, its implication to banks' profitability was assessed represented by the return on assets and return on equity. The capital adequacy variable has very high positive relationship on return on assets, with a p-value of 0.00 ($p < .01$). This finding is consistent with previous studies providing claims that well capitalized banks face low likelihoods of getting bankrupt and reduce cost of funding which results in higher profitability. However, capital adequacy does not have statistically significant effect on ROE, implying that shareholder's return will not be affected by any changes in capital adequacy may it be an increase or decrease. Yet still, return on assets is a better measure of banks' profitability as it represents the rate of return on portfolio investment and is not affected by exceptional events (Naceur and Kandil, 2009). Only the liquidity variable showed significance to ROE yet the data used for ROE failed to fit the regression line given by the R^2 value of approximately 4.88% only. Banks' liquidity, based on results, also determines the ROA highly significant at 1%, which means that a bank with a high level of liquid assets will be able to generate more profits. Bank size, which also represents the degree of monopoly, management efficiency, and cost efficiency do not have a statistically significant effect on ROA and ROE, and therefore do not contribute to bank's profitability.

CONCLUSIONS

This paper aims to identify the effects of capital adequacy regulations on the performance and stability of selected Philippine banks over the sample period of 2004Q1 to 2013Q4. Cost of intermediation (net interest margin) and profitability (ROA & ROE) are the two measures of performance. Evidence from this study provides clear illustration of how capital regulations increase the cost of intermediation, which also supports higher return on assets. Therefore, the higher the capital adequacy set, the higher the cost of intermediation, and the higher the profitability. This only proves that setting financial regulations will help banks to prepare for any unexpected fluctuations that may lead to losses, and also will also aid in the financial system's stabilization.

Because universal and commercial banks are the largest financial institution in the banking sector, they play a very important role as a catalyst for economic growth. Thus, any reduction in the performance of the banking industry will also have adverse effect on the growth of the country, as a whole. Although this may be very challenging for policymakers, balancing major policy aspects (monetary, financial, and fiscal) will be the path to achieve economic development.

Variations among results of related literatures might have been affected by the state of the economies during the sample periods. Furthermore, the current condition of the financial market, bank competition, human resource, and the policies governing the economy are some of the factors to be considered. Timely and dynamic implementation of policies is the key to stabilize the Philippine banking industry. Although the study does not examine all the issues concerning the banking system, the analysis will serve as an initial step in understanding the role of capital adequacy in the banking system of a developing country.

Table 1: Statistics Summary

	NIM1	NIM2	ROA	ROE	CAPR	Maneff	Costeff	Liquidity	Banksiz
Mean	0.120948	0.033400	0.007990	0.003573	0.029016	0.785530	0.013662	0.219921	444578.6
Median	0.116460	0.009944	0.007768	0.003259	0.027835	0.802326	0.014185	0.206313	292444.9
Maximum	0.207228	2.104157	0.045111	0.017504	0.148649	0.951159	0.034734	0.606803	1750993.
Minimum	0.068689	-0.003503	-0.002958	-0.001137	-0.014370	0.564067	0.002775	0.064360	39007.33
Std. Dev.	0.026638	0.217131	0.003098	0.002136	0.015813	0.074334	0.004104	0.078087	368093.3
Skewness	0.639226	9.229633	6.176098	1.657408	1.911162	-0.825936	-0.169692	1.473836	1.339083
Kurtosis	3.203602	86.29086	68.80916	9.216685	13.51518	3.400478	4.546461	6.701716	4.351033
Observations	352	352	352	352	352	352	352	352	352

Table 2: Results of Regression

NIM1	Pooled OLS Regression	Between (Variation)	Within (Fixed Effect)	Random Effect	First Difference (Fixed Effect)*	First Difference (Random Effect)
CAPR	0.674	0.843	0.497	0.807	0.039 (1.296005)	0.041
ManEff	0.708	0.775	0.264	0.456	0.526 (0.0828457)	0.591
CostEff	0.023	0.656	0.234	0.116	0.633 (0.975341)	0.757
Liquidity	0.435	0.809	0.042	0.08	0.377 (-0.1116837)	0.41
Bank Size	0.00	0.631	0.00	0.00	0.02 (2.66e-07)	0.004
constant	0.921	0.93	0.686	0.912	0.00 (-0.2725884)	0.095
NIM2	Pooled OLS Regression	Between (Variation)	Within (Fixed Effect)	Random Effect	First Difference (Fixed Effect)	First Difference (Random Effect)
CAPR	0.507	0.071	0.862	0.507	0.95	0.523
ManEff	0	0.006	0.654	0	0.756	0.026
CostEff	0.268	0.017	0.54	0.268	0.906	0.995
Liquidity	0.339	0.275	0.591	0.338	0.871	0.764
Bank Size	0.96	0.911	0.05	0.96	0.115	0.72
constant	0.761	0.027	0.005	0.761	0.00	0.123
ROA	Pooled Ols Regression	Between (Variation)	Within (Fixed Effect)	Random Effect	First Difference (Fixed Effect)	First Difference (Random Effect)*
CAPR	0.00	0.654	0.00	0.00	0.00	0.00 (0.0327761)
ManEff	0.127	0.041	0.712	0.549	0.81	0.894 (0.000239)

Table 2: Contd.,						
CostEff	0.918	0.047	0.016	0.341	0.048	0.126 (0.0492812)
Liquidity	0.001	0.067	0.005	0.002	0.033	0.01 (0.0043139)
Bank Size	0.27	0.197	0.98	0.59	0.984	0.85 (7.79e-11)
constant	0.003	0.049	0.28	0.038	0.27	0.153 (-0.0022393)
ROE	Pooled OLS Regression	Between (Variation)	Within (Fixed Effect)	Random Effect	First Difference (Fixed Effect)	First Difference (Random Effect)
CAPR	0.105	0.274	0.246	0.148	0.107	0.131
ManEff	0.35	0.057	0.346	0.878	0.385	0.712
CostEff	0.685	0.055	0.03	0.299	0.064	0.152
Liquidity	0.006	0.109	0.001	0.003	0.021	0.009
Bank Size	0.10	0.315	0.88	0.34	0.996	0.534
constant	0.663	0.198	0.23	0.347	0.22	0.427

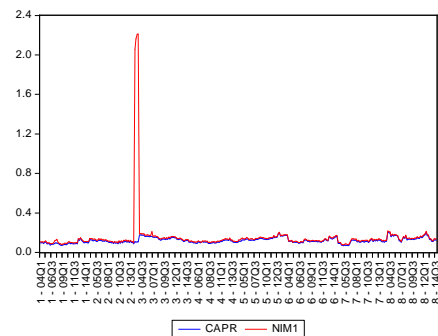


Figure 2: CAPR and NIM1

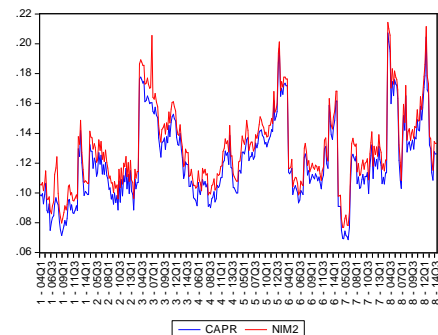


Figure 3: CAPR and NIM2

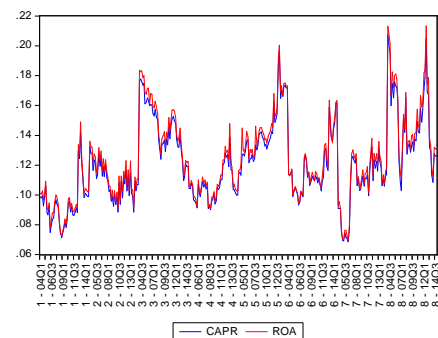


Figure 4: CAPR and ROA

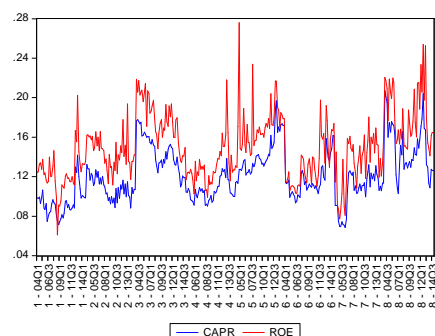


Figure 5: CSAPR and ROE

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